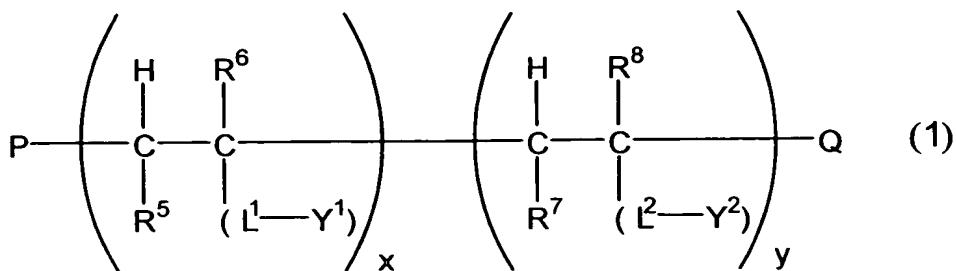


## CLAIMS

What is claimed is:

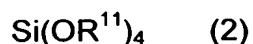
1. A film-forming composition comprising a hydrolysis product and/or a condensation product of a compound having a repeating unit represented by Formula (1) below



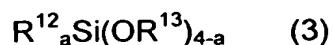
(in the formula, at least one of P and Q is a silane coupling group represented by  $-L^3-Si(R^3)_m(OR^4)_{3-m}$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ , and  $R^8$  independently denote a hydrogen atom or a hydrocarbon group having 1 to 8 carbons,  $m$  denotes 0, 1, or 2,  $x$  denotes a range of 100 to 1 mol %,  $y$  denotes a range of 0 to 99 mol %, and P and Q denote terminal groups;  $L^1$ ,  $L^2$ , and  $L^3$  independently denote a single bond or a divalent organic linking group,  $Y^1$  and  $Y^2$  independently denote  $-N(R^9)(R^{10})$ ,  $-OH$ ,  $-NR^0COR^9$ ,  $-CON(R^9)(R^{10})$ ,  $-OR^9$ ,  $-CONR^9_2$ ,  $-COR^9$ ,  $-CO_2M$ ,  $-COOR^9$ , or  $-SO_3M$ , in which  $R^0$ ,  $R^9$ , and  $R^{10}$  independently denote a hydrogen atom or an alkyl group having 1 to 8 carbons,  $R^0$  and  $R^9$  may form a ring structure, and M denotes a hydrogen atom, an alkali metal, an alkaline earth metal, or onium).

2. The film-forming composition according to Claim 1, wherein  $L^1$  and  $L^2$  in Formula (1) are single bonds and  $L^3$  is an alkyleneethio group.

3. The film-forming composition according to Claim 1, wherein the composition comprises a hydrolysis product and/or a condensation product of a compound represented by Formula (1) and at least one type of silane compound selected from the group consisting of a compound represented by Formula (2) below and a compound represented by Formula (3) below



(in the formula,  $R^{11}$  denotes a monovalent organic group)

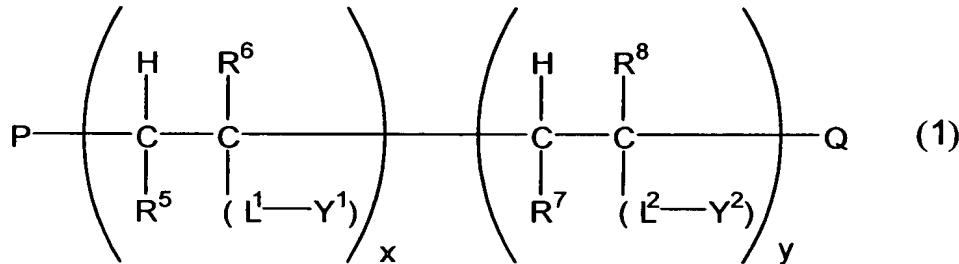


(in the formula,  $R^{12}$  denotes a hydrogen atom, a fluorine atom, or a monovalent organic group,  $R^{13}$  denotes a monovalent organic group or an organosilicon group, and  $a$  denotes an integer of 1 or 2).

4. The film-forming composition according to Claim 3, wherein  $R^{11}$  in Formula (2) is an alkyl group having 1 to 5 carbons.

5. The film-forming composition according to Claim 3, wherein  $R^{12}$  and  $R^{13}$  in Formula (3) independently denote an alkyl group having 1 to 5 carbons.

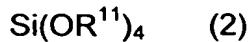
6. A process for producing a film-forming composition, the process comprising a step of hydrolyzing and/or condensing a compound having a repeating unit represented by Formula (1) below



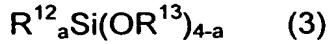
(in the formula, at least one of  $P$  and  $Q$  is a silane coupling group represented by  $-L^3-Si(R^3)_m(OR^4)_{3-m}$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ , and  $R^8$  independently denote a hydrogen atom or a hydrocarbon group having 1 to 8 carbons,  $m$  denotes 0, 1, or 2,  $x$  denotes a range of 100 to 1 mol %,  $y$  denotes a range of 0 to 99 mol %, and  $P$  and  $Q$  denote terminal groups;  $L^1$ ,  $L^2$ , and  $L^3$  independently denote a single bond or a divalent organic linking group,  $Y^1$  and  $Y^2$  independently denote  $-N(R^9)(R^{10})$ ,  $-OH$ ,  $-NR^0COR^9$ ,  $-CON(R^9)(R^{10})$ ,  $-OR^9$ ,  $-CONR^9_2$ ,  $-COR^9$ ,  $-CO_2M$ ,  $-COOR^9$ , or  $-SO_3M$ , in which  $R^0$ ,  $R^9$ , and  $R^{10}$  independently denote a hydrogen atom or an alkyl group having 1 to 8 carbons,  $R^0$  and  $R^9$  may form a ring structure, and  $M$  denotes a hydrogen atom, an alkali metal, an alkaline earth metal, or onium).

7. The process for producing a film-forming composition according to Claim 6, wherein the process comprises a step of hydrolyzing and/or condensing a compound represented by Formula (1) and at least one type of silane compound selected from the group consisting of a compound

represented by Formula (2) below and a compound represented by Formula (3) below

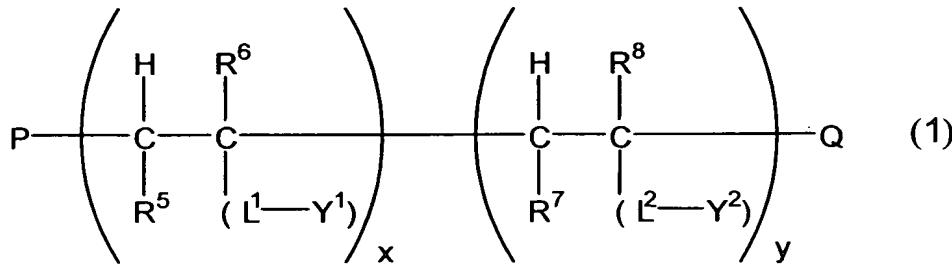


(in the formula, R<sup>11</sup> denotes a monovalent organic group)



(in the formula, R<sup>12</sup> denotes a hydrogen atom, a fluorine atom, or a monovalent organic group, R<sup>13</sup> denotes a monovalent organic group or an organosilicon group, and a denotes an integer of 1 or 2).

8. A porous insulating film formed by using a film-forming composition comprising a hydrolysis product and/or a condensation product of a compound having a repeating unit represented by Formula (1) below

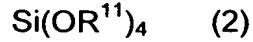


(in the formula, at least one of P and Q is a silane coupling group represented by -L<sup>3</sup>-Si(R<sup>3</sup>)<sub>m</sub>(OR<sup>4</sup>)<sub>3-m</sub>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, and R<sup>8</sup> independently denote a hydrogen atom or a hydrocarbon group having 1 to 8 carbons, m denotes 0, 1, or 2, x denotes a range of 100 to 1 mol %, y denotes a range of 0 to 99 mol %, and P and Q denote terminal groups; L<sup>1</sup>, L<sup>2</sup>, and L<sup>3</sup> independently denote a single bond or a divalent organic linking group, Y<sup>1</sup> and Y<sup>2</sup> independently denote -N(R<sup>9</sup>)(R<sup>10</sup>), -OH, -NR<sup>0</sup>COR<sup>9</sup>, -CON(R<sup>9</sup>)(R<sup>10</sup>), -OR<sup>9</sup>, -CONR<sup>9</sup><sub>2</sub>, -COR<sup>9</sup>, -CO<sub>2</sub>M, -COOR<sup>9</sup>, or -SO<sub>3</sub>M, in which R<sup>0</sup>, R<sup>9</sup>, and R<sup>10</sup> independently denote a hydrogen atom or an alkyl group having 1 to 8 carbons, R<sup>0</sup> and R<sup>9</sup> may form a ring structure, and M denotes a hydrogen atom, an alkali metal, an alkaline earth metal, or onium).

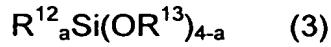
9. The porous insulating film according to Claim 8, wherein L<sup>1</sup> and L<sup>2</sup> in Formula (1) are single bonds and L<sup>3</sup> is an alkylenethio group.

10. The porous insulating film according to Claim 8, wherein the film-forming composition comprises a compound represented by Formula (1) and at

least one type of silane compound selected from the group consisting of a compound represented by Formula (2) below and a compound represented by Formula (3) below



(in the formula, R<sup>11</sup> denotes a monovalent organic group)



(in the formula, R<sup>12</sup> denotes a hydrogen atom, a fluorine atom, or a monovalent organic group, R<sup>13</sup> denotes a monovalent organic group or an organosilicon group, and a denotes an integer of 1 or 2).

11. The porous insulating film according to Claim 10, wherein R<sup>11</sup> in Formula (2) is an alkyl group having 1 to 5 carbons.

12. The porous insulating film according to Claim 10, wherein R<sup>12</sup> and R<sup>13</sup> in Formula (3) independently denote an alkyl group having 1 to 5 carbons.